

Testing preparation of VZ22Q/VZ22M for 3GPP



SEQUANS Communications Les Portes de la Défense – Hall A 15-55 Boulevard Charles de Gaulle 92700 Colombes - France Phone. +33.1.70.72.16.00 Fax. +33.1.70.72.16.09 www.sequans.com contact@sequans.com

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Document Revision History

Revision	Date	Description
01	2014-12-19	Initial Revision
02	2014-12-31	Update USAT section
03	2014-01-26	Update USAT section, Added FCC safety warning

Referenced Documents

Revision	Date	Document Name	Document Title

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FCC Warning

Manual Information to the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual.

Federal Communication Commission Interference Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator & your body.

End Product Labeling

When the module is installed in the host device, the FCC ID label must be visible through a window on the final device or it must be visible when an access panel, door or cover is easily re-moved. If not, a second label must be placed on the outside of the final device that contains the following text: "Contains FCC ID: COFVZ22Q"

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The grantee's FCC ID can be used only when all FCC compliance requirements are met.

This device is intended only for OEM integrators under the following conditions:

(1) The antenna must be installed such that 20 cm is maintained between the antenna and users,

(2) The transmitter module may not be co-located with any other transmitter or antenna.

(3) To comply with FCC regulations limiting both maximum RF output power and human exposure to RF radiation, the maximum antenna gain including cable loss in a mobile exposure condition must not exceed:

Standalone Condition:

- 10 dBi in 700 MHz Band
- 6 dBi in 1700 MHz Band

Assuming collocated with an ordinary WLAN/WiMax transmitter with 34 dBm average EIRP power

- 6.5 dBi in 700 MHz Band
- 6 dBi in 1700 MHz Band

Remark: This assumption is not valid if the output power of the collocated WLAN/ WiMax transmitter is higher than 34 dBm.

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for reevaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

Testing preparation of VZ22Q/VZ22M device for 3GPP

General instructions

We assume that the device has been previously screened, and flashed in FFF mode.

Please follow the recommendation in the appendixB, if you want to upgrade to a new firmware.

- 1- Check that you have all the following elements before to start:
- VZ22Q board
- SequansD driver to install on the host PC
- File format like Verizon_4.1.2.0-SFN-17924.exe, sqn_setup_4.1.2.0-SFN- 17924.exe)
- DM tool to install on the host PC for debug
 - File format like sqn_setup_4gdm_4.1.2.0-17545.exe
 - 1 USB Cable to connect to the host PC
- Path loss of the internal small RF cable, present inside the box
 - Band 4 : 0.8 dB
 - o Band 13: 0.3 dB
- PICS/PIXIT file (Mainly for LTE signaling testing)

If you have **checked and ticked all items**, you are ready to start the testing preparation. If something is missing, please contact Sequans Communications for help.

2 – Install the Sequans driver and tools on the host PC if not done. (See Appendix C)

3 - Connect according to Appendix A (RF cable, USB cable, Sim insertion, ...)

4 - Open the Windows device manager, you should see the device enumerated after few seconds, with following interfaces.

- USB/ECM network interface
- ACM port (for AT commands)

5 – Check if device configuration is correctly set for 3gpp conformance testing, using following commands using ACM COM port 115200-8-n-1 (Use Putty or Teraterm tools):

- AT+SQNCTM?
- AT+SQNAUTOCONNECT?
- You should read
 - o > AT+SQNCTM?
 - > SQNCTM: **3gpp-conformance**
 - > AT+ SQNAUTOCONNECT?
 - **> 1**

6 - If the configuration is not as expected, using following commands, to set the correct one:

- AT+SQNCTM="3gpp-conformance"
- AT^RESET
 - Wait reboot completed
- AT+SQNAUTOCONNECT=1,1
- AT^RESET
 - Wait reboot completed

7 - Now the device is ready for testing

- To Power On or Power Off the device you can, depending of the tester automation or manual mode testing:
 - Send command AT+CFUN=1 or AT+CFUN=0

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- Send command AT^RESET
- Power cycle by unplugging and Plugging the USB
- Power cycle by using tester power switching

3GPP TS 36.521-1 (LTE RF), 3GPP TS 36.521-3 (LTE RRM)

No Specific additional AT command and configuration are used for testing LTE RF/RRM, except the one described in the general instruction section.

3GPP TS 36.523-1 (LTE Signaling)

Specific AT command and configuration are used for testing LTE signaling

- The auto connection mode must be disabled by using AT+ SQNAUTOCONNECT=0,1
- Take care to use a recent PICS/PIXIT files on the tester system.
- To clean forbidden PLMN (optional):

3GPP TS 36.124 (USAT)

Some dedicated configurations are required after board preparation for USAT testing:

1 - A specific operator mode: verizon-conformance by using AT+SQNCTM command.

- 2 The Cid 1 must be activated as the default PDN by using AT+ IMSTESTMODE command.
 Please note that the APN name supporting this Cid 1 is insignificant for the testing.
- 3 The Cid 1 must be present or set in the APN provisioning list, by using **AT+VZWAPNE** command
 - AT+VZWAPNE=1,1,"vzwims","IP","LTE","enabled",1

4 - A specific STK APN **TestGp.rs** name is required to be used to open connection for some test case, by using **AT+SQNSTKAPNE** command.

• Please check in **Appendix E**, the default APN to use per test case.

5 – Some USAT conformance tester (Like Comprion+R&S) use only IPV4 configuration. Please check for Anritsu +7 layer solution.

• Replace "IP" "by IPv4v6" in your configuration setting if required.

The following AT command setting must be applied for configuration, before to start the testing:

- AT+SQNCTM=" verizon -conformance"

- AT^RESET
 - \circ Wait reboot completed
 - AT+IMSTESTMODE=1,1
- AT^RESET
 - Wait reboot completed
 - AT+SQNSTKAPNE="TestGp.rs","IP" or AT+SQNSTKAPNE="vzwims TestGp.rs","IP"
 - Please make sure to revert to correct one, before to start a new test case.

All the above settings are persistent after reboot.

You can check if the configuration is as expected with following commands:

- AT+SQNCTM?
- AT+IMSTESTMODE?
- AT+VZWAPNE?

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6 - Depending on the activities from some Windows services on the laptop used as host, sporadic Uplink data may. It is recommended before to start the testing, to disable the **192.168.15.1** network adapter to stop data from laptop. The second 192.168.16.1 interface can be activated as debug port, if required to take some logging using Sequans DM tool.

Please check in Appendix F the mean to identify and disable this port.

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Appendix A – Device Cabling

Please connect the device according to the following diagram:



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Appendix B – Firmware upgrade

In order to upgrade the firmware (FFF Mode), please, follow these steps:

- 1- Connect the device on a WINDOWS PC, and wait 1 min during the device enumeration.
- 2- Open a web browser, and enter the URL http://192.168.15.1/
- 3- Enter the login "root", and the password "root" in order to acces to the web ui

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- 4- Click on "system" and on "backup/flash firmware", and untick "Keep settings"
- 5- Click on "browse" and select the .sfp file to flash 'for example SQN3221-VZ22M-REV1_ECM-ACM-VERIZON-REL9_LR4.1.2.0-SFN-17924.sfp)

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I92.168.15.1/cgi-bin/luci/;stok=9a2e86399220177d7bb3ac5c909085b2/admin/system/flashops/		∀ C Q 8.2.1.2.1_1	→ ☆ 自 🕹 🏾		
Witt OpenWitt Barrier Breaker r96502 Load: 0.20 0.22 0.10 Status System Network Logout System Administration Software Startup Scheduled Tasks Backup / Flash Firmw Flash operations Configuration Backup / Restore Click 'Generate archive' to download a tar archive of the current configuration files. To reset the Download harkwin: Operation files. To reset the Download harkwin: Operation			Search FIRMWARE		
Reset to defaults: To restore configuration files, you can upload a previously generated backup archive here. Restore backup:	Desktop Local Dick (C) Local Dick (C) Local Dick (C) Guenents Git Music File name: UICC PASS Ber	G SQN2221-V222M-REV1_LRA1.2.0-SFN-17871.lgt G SQN221-V222M-REV1_LRA1.2.0-SFN-17871.lgt SQN221-V222M-REV1_CCM-ACM-FFH-VERZON_LRA1.2.0-S SQN2221-V222M-REV1_SCM-ACM-FFH-VERZON_LRA1.2.0-S SQN221-V222M-REV1_LRA1.2.0-SFN-17871 UICC-PASS_Report_141117 CC PASS_Report_141172 in CC PASS_REPORT_1411172 in CC PASS_REPORT_141172 in CC PASS_REPORT_141172 in			
Upload a sysupgrade-compatible image here to replace the running firmware. Check "Keep sett Keep settings: OTA (Over The Air) Image:			Open Cancel		
Image:	wse_ No file selected. 🔲 Flash in	nage			

6- Click on "Flash image"

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time Confirmation												
Backup / Restore												
Click "Generate archive" to de	ownload a tar archiv	ve of the current con	figuration files. To	reset the firmwa	are to its initial state, cli	ck "Perform reset" (only	possible with squas	hfs images).				
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Flash new firmware ima Upload a sysupgrade-compati Keep settings: OTA (Over The Air) Image Image:	ible image here to r	eplace the running fi	rmware. Check "K	eep settings" to	No file selected.	guration (requires an Op	enWrt compatible fir	mware image).				

- 7- A new page with checksum will appear 2 min after the clicking of "flash firmware". Confirm the flash and wait for 2 min.
- 8- The target is now flash.
- 9- Configure the settings defined in the "general instruction" topic of this document

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Appendix C – Sequans Driver installation

In order to install SEQUANS drivers (on WINDOWS PC), please, follow these steps:

- 1- Make sure the device is unplugged and uninstall any previous versions of Sequans drivers on the test host device
- 2- · Launch the executable file "Verizon_4.1.2.0-SFN-17924.exe" for the drivers and confirm its execution. Click Yes button to start the installation process

User /	Account	Control	×
2	Do yo chang	u want to allow es to this comp	the following program to make uter?
		Program name: Verified publisher: File origin:	Sequans Communications 4G solution Setup Sequans Communications Hard drive on this computer
Sho	ow detai	ls	Yes No
~			Change when these notifications ap

3- Click Next

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4- Read the Sequans License Agreement. Click "I accept" if you agree with the License terms and want to continue the installation

License Agreement Please read the following important information before continuing.	<u>1</u>
Please read the following License Agreement. You must accept the terms of this agreement before continuing with the installation.	
WHATSOEVER. IN NO EVENT SHALL SEQUANS COMMUNICATIONS BE LIABLE FOR ANY CLAIM, DAMAGES OR LOSS - INCIDENTAL, INDIRECT, SPECIAL OR CONSEQUENTIAL - ARISING FROM, OUT OF OR IN CONNECTION WITH THE PRODUCT. No Intellectual Property or licensing rights shall be assigned to USER, under any form or for any purpose whatsoever, with respect to the PRODUCT. Any modification, whatsoever, of the PRODUCT is strictly prohibited WITHOUT PRIOR WRITTEN CONSENT OF SEQUANS Communications.	* III
THE USE OF PRODUCT IS SUBJECT TO THE PRIOR ACCEPTANCE OF THE TERMS AND CONDITIONS OF THE ABOVE DISCLAIMER.	•
I accept the agreement	
I do not accept the agreement	
< Back Next >	Cancel

5- Select the installation directory. The default directory can be changed by clicking the Browse button. Click Next when the appropriate directory is selected

Select Destination Location	G solution	
Where should Sequans Communicat	ions 4G solution be installe	
Setup will install Sequans C	Communications 4G solution	into the following folder.
To continue, click Next. If you would	l like to select a different fo	der, click Browse.
C:\Program Files (x86)\Sequans Co	mmunications	Browse
At least 2.1 MB of free disk space is	required.	
A least 2.1 Mb of the disk space is	requieu.	

6- Select the Start Menu folder name. The default folder can be changed by clicking the **Browse** button. Click **Next** when the appropriate folder is selected

Setup - Sequans Communications 4G s	olution		
Select Start Menu Folder			
Where should Setup place the program	shortcuts?		Ċ
Setup will create the program's	shortcuts in the follow	ing Start Menu	folder.
To continue, click Next. If you would like	e to select a different f	older, click Bro	wse.
Sequans Communications		E	rowse
🔲 Don't create a Start Menu folder			
			1.14

7- Verify the installation directory and click **Install** if no change is required. You can update the installation directory by clicking the **Back** button at this stage

1	🐐 Setup - Sequans Communications 4G solution
	Ready to Install Setup is now ready to begin installing Sequans Communications 4G solution on your computer.
	Click Install to continue with the installation, or click Back if you want to review or change any settings.
	Destination location: C:\Program Files (x86)\Sequans Communications
	₹
	< Back Install Cancel

8- Check the box to proceed with the installation process

•= Windows Security	X
Would you like to install this device software?	
Name: Sequans Network adapters Publisher: Sequans Communications	
Always trust software from "Sequans Communications".	't Install
You should only install driver software from publishers you trust. <u>How can I decide</u> <u>device software is safe to install?</u>	which

9- Click Finish to complete the installation process

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Appendix D – Tester configurations

If possible, we recommend using the below tester configurations for 3GPP conformance, since those setups are used by Sequans for pre-testing:

3GPP TS36.523-1

• Anite9000 + CT v33.0

3GPP TS36.521-1

- R&S TS8980 Contest v11.0 RF v3.21
- Anritsu ME7873L MCTS v2.18

3GPP TS36.521-1

- R&S TS-RRM Contest v11.0 RRM v5.71
- Anritsu ME7873L MCTS v2.18

3GPP TS 31.121

- COMPRION IT3 + R&S CMW500 (preferred)
- COMPRION IT3 + Anritsu MD8475A

ETSI TS 102 230

COMPRION IT3.

3GPP TS 31.124

- COMPRION IT3 + R&S CMW500 (preferred)
- COMPRION IT3 + Anritsu MD8475A

Appendix E – Usat default APN Setting Per TC

The **AT+SQNSTKAPNE** command must be used, to set the APN to open connection as required per Test Case.

тс	Description	Default STK APN
	OPEN CHANNEL Immediate link	
27.22.4.27.6/1	establishment, E-UTRAN, bearer type '02'	AT+SQNSTKAPNE="TestGp.rs","IP",1
	OPEN CHANNEL Immediate link	
27.22.4.27.6/2	establishment, E-UTRAN, bearer type '0B'	AT+SQNSTKAPNE="TestGp.rs","IP",1
	OPEN CHANNEL Immediate link	
	establishment, E-UTRAN, bearer type '02',	
	with Network Access Name, with alpha	
27.22.4.27.6/3	Identifier	AT+SQNSTKAPNE= TestGp.rs", "IP", I
	OPEN CHANNEL IMMediate IMK	AT SONSTRADUE-" Toston re
27 22 4 27 6/5	default EPS hearer	" "ID" 1
27.22.4.27.075	CLOSE CHANNEL Default EPS bearer	AT+SONSTKAPNE="TestGp.rs
27.22.4.28.3/1	successful	","IP",1
	CLOSE CHANNEL EPS bearer with APN	
27.22.4.28.3/2	different from default APN, successful	AT+SQNSTKAPNE="TestGp.rs","IP",1
	RECEIVE DATA Already opened channel -	
27.22.4.29.1/2	EUTRAN, APN different from default	AT+SQNSTKAPNE="TestGp.rs","IP",1
	SEND DATA Immediate mode - E-UTRAN,	AT+SQNSTKAPNE=" TestGp.rs
27.22.4.30.3/1	Default EPS bearer	","IP",1
	SEND DATA Store mode - E-UTRAN, APN	
27.22.4.30.3/2	different from default APN	AT+SQNSTKAPNE="TestGp.rs","IP",1
	GET CHANNEL STATUS EPS bearer with APN	
27.22.4.31.1/4	different from default APN	AT+SQNSTKAPNE="TestGp.rs","IP",1
	GET CHANNEL STATUS EPS bearer with APN	
	different from default APN, after a link	
27.22.4.31.1/5	dropped	AT+SQNSTKAPNE="TestGp.rs","IP",1

Appendix F – Deactivation of 192.168.15.1 Port

To avoid Uplink data pollution, and prevent unexpected RRC connection requedtst during the testing, it is recommended to disable the 192.168.15.1 port through the Windows Network Adapter panel (Check below screenshot).



1 – Use ipconfig/all command to identify the interface 192.168.15.1



2 - Right click on the interface to disable

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3 - The 192.168.15.1 interface is now disabled